Hydrology and Earth System Sciences

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Discussions

Interactive comment on "High-resolution estimation of the water balance components from high-precision lysimeters" *by* M. Hannes et al.

Anonymous Referee #2

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The paper does not represent a substantial contribution to scientific progress, being poor in new concepts, ideas and methods. In this form, the paper shows a simple signal-processing application rather than a lysimeter_based experiment. Experimental dataset is short in time extension (only 2 months) and poor in natural "water balance terms" variability. Results focus on little time windows, without interview longtime effect on water balance and emphasizing on the performance of the adopted filtering scheme. However, I suggest a strong reorganization of the paper as technical note.

Abstract requires a strong rearrangement. Objects of the paper are poor and emphasize a simple mathematical application rather a lysimeter_based experiment P571-L1: precipitation or net precipitation? did you considered the intercepted precipitation? P571-L4: I do not agree that Eddy flux system is a direct method for ET measurement.

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Interactive Discussion

Discussion Paper

ET value is an indirect estimation obtained from atmospheric measurements and "eddy flux", computed as a covariance between instantaneous deviation of wind speed and air water concentration.

The first period of the introduction is confused. The "boundary" term is improperly allocated. The bibliography on lysimeter study is poor. Moreover, the paper of Robinson et al. (2004) regards a study over the lysimeter water collection efficiency (geometrical aspect) and on the knowledge of radionuclides transport (soil physical aspects). I suggest an overview on the error types and on their propagation theory. The period in P572-L16-29 is not clear. Is known that, when we obtain a water balance term from a difference operation, the errors are hidden in the computation.

P573-L25. ….However, for integrating evapotranspiration data from lysimeters into larger-scale hydrologic or climate models, adequate filtering algorithms are essential to provide the required data accuracy……Relatively to the above sentence, question raised in my mind is related to the costs, especially when lysimeter method are used for regional scale study. Moreover, your data quality, obtained with sophisticate filtering procedure, is scientifically and economically justified when up-scaling errors are considered? I doubt on the applicability of lysimeter data for hydrological forecasting!!

As explained in the abstract, objects emphasize a simple mathematical application rather a lysimeter_based experiment.

Relatively to the Smoothing filter (2.2.4), seem that Savitzky–Golay filter and moving average have the same performance to reduce the errors. Only when will set a 1st degree polynomial, SG filter has comparable performance with moving average. Moreover, SG has the capability of detects particular events (dew and rime) included into data series. The performance is linked to the choice of polynomial's degree and windows length.

Discussion Paper

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 569, 2015.